

REMARKS

Claims 1–7 are pending in the application. In the Office action dated February 18, 2009, claims 1–7 were rejected. Responsive to the Office action, claims 1–7 are amended. In view of the amendments above, and the remarks below, Applicant respectfully requests reconsideration of the rejected claims under 37 C.F.R. § 1.111.

Objections to the Drawings

The drawings are objected to for the following reasons:

In Figs. 5 and 10, the cross-hatching pattern is purportedly not in according with the guidelines set out in MPEP § 608.02.

The Examiner asserts that Figs. 7 and 12 contain extraneous written matter.

The Examiner asserts that in Figs. 7 and 12, separated elements within the same figure are not either connected by dotted lines or by brackets to designate all of the elements as one complete figure.

The figures purportedly fail to show every feature of the invention specified in the claims. Specifically, the Examiner asserts that:

- The locking rings sliding in a radial and an axial direction on a shoulder as recited in claim 2 is not shown in the Figures;
- The locking rings having teeth with slanted flanks and notches with straight sides as recited in claim 4 is not shown in the Figures; and
- The teeth and notches having a sufficient clearance to absorb possible small deformations of the locking rings recited in claim 5 is not shown in the Figure.

Responsive to the Examiner's objections, Applicant hereby submits replacement drawings. The new drawings include Figures 1–16 and replace Figures 1–12 as originally filed.

Replacement Figs. 1 and 2 have been enlarged with respect to their previous versions.

In Fig. 1, the original reference numeral 16 which indicated the shoulder of the connection unit 7 has been changed to reference numeral 15, to bring the drawing into

conformance with the specification. The center line exiting from connection unit 8 has been corrected to more accurately depict the centerline.

In Fig. 2 the clearance between the teeth 3, 6 and the corresponding notches 12, 11 in the connection units 7 and 8 is now more clearly visible.

In Figs. 5 and 6, the apparent crosshatching has been removed. The apparent crosshatching was intended to be shading to indicate the top of the teeth.

In Fig. 7, sections A-A and B-B have been made individual Figures, which are now numbered Fig. 13 and Fig. 14, respectively.

In Fig. 12, sections A-A and B-B have been made individual Figures, which are now numbered Fig. 16. and Fig. 15, respectively.

In Figs. 10 and 11, the apparent crosshatching has been removed.

In view of the amendments to the drawings, Applicant respectfully requests that the objections to the drawings be withdrawn.

Objections to the Specification

The abstract of the disclosure is objected to because of the use of legal phraseology. In response, the Applicant has amended the abstract of the disclosure as suggested by the Examiner.

The disclosure is further objected to due to a series of informalities. Applicant has amended the specification as suggested by the Examiner.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. In response, Applicant has amended the specification to recite locking rings sliding in a radial and an axial direction on a shoulder, as recited in claim 2; locking rings having teeth with straight flanks and notches with slanted sides at the sides facing the connection units, as recited in claim 3; locking rings having teeth with slanted flanks and notches with straight sides, as recited in claim 4; and teeth and notches having a sufficient clearance to absorb possible small deformations of the locking rings, as recited in claim 5.

Support for the amendments may be found in the claims as originally filed, which are part of the specification.

Objections to the Claims

Claims 1, 2, 6, and 7 are objected to as containing a number of informalities. Applicant takes this opportunity to amend claims 1, 2, 6, and 7 as suggested by the Examiner. Further, Applicant has amended the claims to remove reference numerals, as suggested by the Examiner.

Rejections under 35 U.S.C. § 112

Claims 1–7 are rejected under 35 USC § 112, second paragraph as being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner contends that claim 1 is generally narrative and indefinite, and fails to conform with current U.S. practice. Applicant has amended claim 1 so as to correct a variety of grammatical and idiomatic errors.

In addition, the term "radial" has been replaced by the term "angular" in some portions of the specification and claims, as being a more accurate descriptor of the invention. Furthermore, Applicant has amended claim 1 to particularly claim a locking arrangement that comprises the locking rings.

However, Applicant respectfully notes that the question of whether the claims satisfy 35 U.S.C. § 112, second paragraph, is whether the claims set out and define the desired subject matter with a reasonable degree of clarity and particularity (see MPEP § 2137.02). As such, the definiteness of the claim must be considered in view of:

(A) The content of the particular application disclosure;

(B) The teachings of the prior art; and

(C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

Many of the Examiner's concerns regarding the claimed locking arrangement are readily satisfied by examining the instant Figures, in conjunction with the specification, and would be readily understood by one of skill in the art of pipe connections, particularly as used in industrial drilling and on drilling rigs.

In particular, where sections of pipe must be connected for use as a "drillstring" in conjunction with "a top drive or tower drill" (see page 1, lines 5–18 of the specification), the ends of the pipe sections are fitted with threaded connection units (one male, one female). The series of connected pipes that make up a drill string are used to transfer drilling fluid as well as to transfer rotational power to the terminal drill bit. As should be readily understood, the threaded connections between pipe segments must be secured with respect to rotation, so that they cannot unscrew accidentally. Furthermore, these couplings must withstand tremendous forces, as torque from the drive above ground is transferred the length of the pipe sections to the drill bit. The present application is directed to a locking arrangement that is capable of providing a secure lock, and yet which can be operated more safely and more quickly than the set of flanges currently in use in the industry.

Put simply, the locking arrangement quickly and simply interlocks a first and second pipe segment together, so they cannot rotate with respect to the other.

With respect to Fig. 1 of the application, the locking arrangement comprises locking rings 1 and 2, and that each locking ring has two sides, or edges. The first sides of rings 1 and 2 correspond to the edges that face inwards toward the other of the locking rings. As claimed, and as depicted in the Figures, these first sides engage each other with teeth 4, 5 that interlock. In the depicted embodiment, the first sides have four teeth which interlock.

The second sides, or the edges of the locking rings which face outwardly with respect to the other locking ring, are configured to engage with the notches present on the first and second connection unit 7, 8. In operation, the two locking rings are fully engaged at their first sides, and the two connection units are threaded together. At this point the first and second locking rings

are spread apart, outwardly, toward the connection units 7 and 8 respectively. The teeth on the second side of locking ring 1 are fully engaged with the notches 12 on the facing edge of connection unit 7, while the teeth on the second side of locking ring 2 are rotated until they fully engage with notches 11 on the facing edge of connection unit 8. At this point, with each locking ring fully interlocked with its respective connection unit, the two locking rings can be locked in the spread position by means of a locking device 13 in the axial direction.

In view of the amendments to the claims, and the above explanation, Applicant respectfully suggests that the claims now particularly define and claim the Applicant's invention, and request the withdrawal of the rejection of claims 1–7 under 35 U.S.C. § 112.

Rejections under 35 U.S.C. § 102

Claims 1–5 are rejected under 35 U.S.C. § 102(b) as being anticipated by Myers et al (U.S. Patent no. 4,655,482).

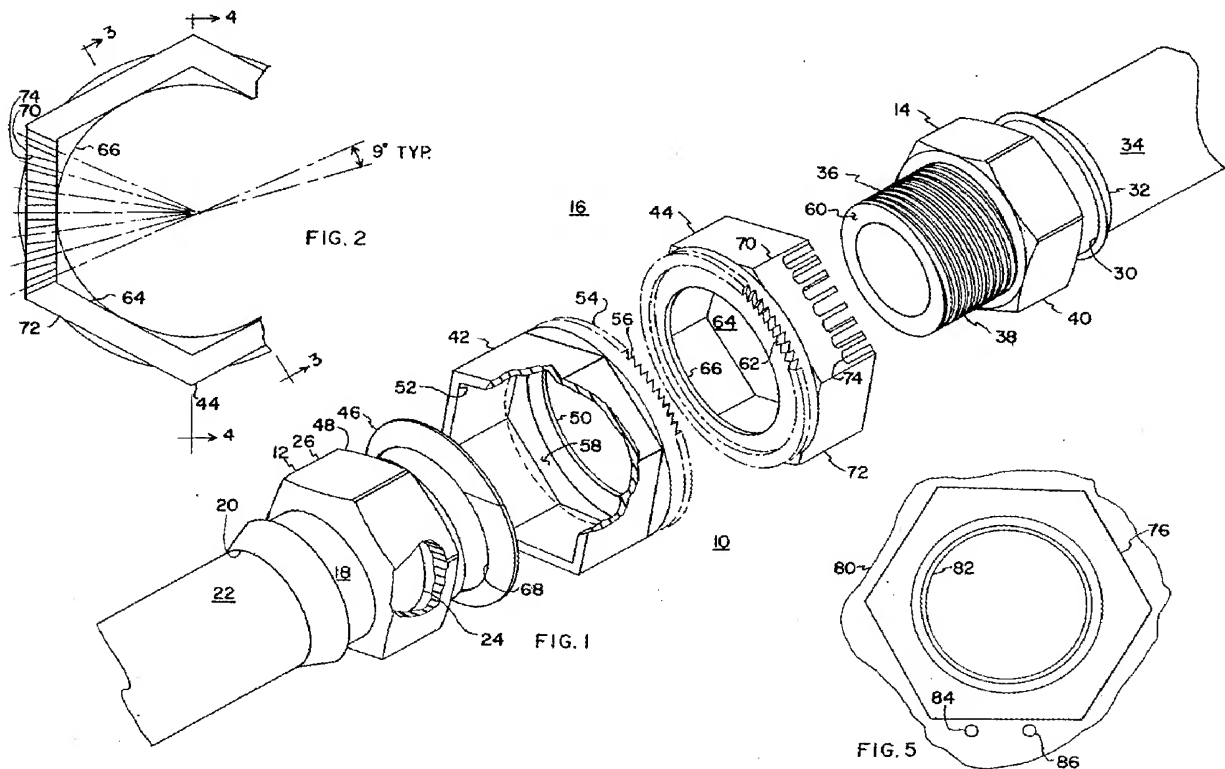
Applicant respectfully disagrees, for at least the following reasons:

The claimed locking arrangement differs significantly from the coupling device of Myers et al., both in function and purpose. For example, the Myers coupling device utilizes ratcheting teeth 56 as a locking device. By their nature, ratchet teeth are unidirectional, providing a locking action with respect to one direction of rotation, but no locking action whatsoever in the opposite direction of rotation. The locking arrangement of claim 1 utilizes the engagement of teeth and notches, permitting strong stable locking in either direction of rotation.

Furthermore, the present locking arrangement prevents any further tightening of the secured connection once the initial connection is locked in place. The Myers coupling permits further tightening. Similarly, although the Myers coupling utilizes spring pressure to keep the ratchet teeth of the coupling engaged, this cannot guarantee movement of the coupling in the direction permitted by the ratchet teeth of the connection. The locking arrangement of claim 1 utilizes a spreading device that locks the device with respect to rotation in either direction.

The Myers coupling is intended to connect tubes for transporting fluids, and is not intended to withstand excessive force or tension. On the other hand, the present locking arrangement is designed for, and is capable of, withstanding the conditions created by oilwell drilling, including the extreme torque created while rotating the connected pipe segments present in a drillstring.

The Examiner, in reviewing the Myers reference has suggested that Myers discloses first and second rings that have a different number of notches and teeth on their second sides. Applicant respectfully disagrees, and suggests that only ring 44 has notches and teeth on the second side of the ring, as shown below in Fig. 1 of Myers:



Furthermore, the connection units of Myers correspond to standard tube couplings having an outer hexagonal shape. The connection units of Myers fail to include shoulders, notches or teeth on the sides facing the locking rings with which to engage the locking rings, as recited in claim 1.

As explained above, by spreading the locking rings of the claimed locking arrangement, each locking ring can engage with a connection unit, as well as interlocking with the other locking ring. However, by spreading the rings 42, 44 of Myers, the locking function of the coupling device is disengaged.

The Examiner asserts that the Myers coupling device includes notches and teeth on the second sides of the locking rings that "are formed to engage a corresponding number of notches and teeth formed on a shoulder at the facing edge of the connection units after the rings 42, 44 are spread apart. Applicant respectfully disagrees. As noted above, if rings 42 and 44 are spread apart, the connection between the two is lost. In addition, if the Examiner is suggesting that notches 74 of Myers form the teeth of the second locking ring, then the corresponding connection unit does not include a "corresponding number" of notches on the shoulder of the connection unit. The connection unit of Myers does not include a shoulder, and does not include teeth or notches that correspond to notches 74.

Applicant notes that the Examiner appears to be suggesting that apertures 84 and 86, as shown in Fig. 5 of Myers, are the "corresponding number" of notches to notches 74. Applicants suggest that two apertures fail to correspond to the number of notches 74 on the second ring of Myers. However, even if they did correspond in number, they fail to correspond in function, as notches 74 do not directly engage apertures 84 and 86, rather a pin 88 is inserted into the aligning hole, and the pin extends into the "aligning notch 74". Applicant suggests the interaction of pin 88 with notch 74 is very different from the notches and teeth of the second ring of the claimed locking arrangement engaging "a corresponding number of notches and teeth formed on a shoulder on the facing edge of the connection unit" as recited in claim 1, as amended.

Furthermore, the combination of pin 88 and aligning notch would not be capable of withstanding the stresses that the claimed locking arrangement can tolerate.

In order to anticipate a claim, the cited reference must disclose each and every element of the claims as it is set out in the claim. In view of the above amendments and remarks, Applicant suggests that the Myers et al. reference fails to anticipate the subject matter of claim 1. With respect to claims 2-7, as they depend directly or indirectly from claim 1, Applicant suggest they are similarly not anticipated by the Myers et al. reference. Applicant therefore respectfully requests the withdrawal of the rejection of claims 1-7 under 35 U.S.C. § 102.

Applicant believes that this application is now in condition for allowance. Accordingly, Applicant respectfully requests that the Examiner issue a Notice of Allowability covering the pending claims. Please charge any additional fees required, or credit any overpayments, to our Deposit Account No. 11-1540. If the Examiner has any questions, or if a telephone interview would in any way advance prosecution of the application, please contact the undersigned agent of record.

CERTIFICATE OF E-FILING

I hereby certify that this correspondence is being transmitted electronically via the U.S. Patent and Trademark Office EFS-Web System on August 18, 2009.

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